

t s10/7/all

10/7/1

DIALOG(R)File 347:JAPIO
(c) 2003 JPO & JAPIO. All rts. reserv.

06883281 **Image available**
INTEGRATED *LOW*-K* DIELECTRIC AND ETCHING STOP LAYER

PUB. NO.: 2001-110789 [JP 2001110789 A]
PUBLISHED: April 20, 2001 (20010420)
INVENTOR(s): BJORKMAN CLAES H
MIN YU MELISSA
SHAN HONGQING
CHEUNG DAVID W
YAU WAI-FAN
CHOPRA NASREEN GAZALA
YIN GERALD ZHEYAO
MOGHADAM FARHAD
HUANG JUDY H
YOST DENNIS J
TANG SUM-YEE BETTY
KIM YUNSANG
LIU KUO-WEI
APPLICANT(s): APPLIED MATERIALS INC
APPL. NO.: 2000-173807 [JP 2000173807]
FILED: June 09, 2000 (20000609)
PRIORITY: 99 329012 [US 99329012], US (United States of America), June
09, 1999 (19990609)

ABSTRACT

PROBLEM TO BE SOLVED: To provide a method for depositing and etching a dielectric layer, where a dielectric constant is low and etching speed changes 3:1, for forming horizontal mutual interconnects.

SOLUTION: Quantity of carbon or hydrogen in a dielectric layer fluctuates due to the *change* in *deposition* condition for installing an etching stop layer or a *low* *k* dielectric in the application of damascene, which can be substituted for the former dielectric layer. Dual-damascene structure having a dielectric layer whose dielectric constant is not less than '2', which is lower than about 4, can execute deposition in the single reactor and is etched so that vertical or horizontal interconnects by making the concentration of carbon; oxygen gas such as carbon monoxide fluctuate. Etching gas for forming the vertical mutual interconnections comprises CO and a fluorocarbon, and CO gas is preferably removed from etching gas for forming the horizontal interconnects.

COPYRIGHT: (C)2001,JPO

?



(19)

(11) Publication number: **2001**

Generated Document.

PATENT ABSTRACTS OF JAPAN

(21) Application number: **2000173807**

(51) Intl. Cl.: **H01L 21/3065 H01L 21/31**

(22) Application date: **09.06.00**

(30) Priority: **09.06.99 US 1999 329012**

(43) Date of application
publication: **20.04.01**

(84) Designated contracting
states:

(71) Applicant: **APPLIED MATERIAL**

(72) Inventor: **BJORKMAN CLAES H
MIN YU MELISSA
SHAN HONGQING
CHEUNG DAVID W
YAU WAI-FAN
CHOPRA NASREEN G
YIN GERALD ZHEYA
MOGHADAM FARHA
HUANG JUDY H
YOST DENNIS J
TANG SUM-YEE BETT
KIM YUNSANG
LIU KUO-WEI**

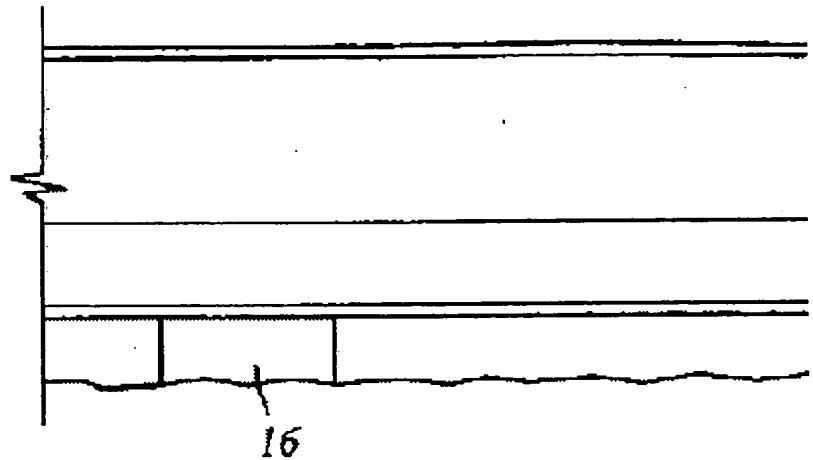
(74) Representative:

(54) INTEGRATED LOW-K DIELECTRIC AND ETCHING STOP LAYER

(57) Abstract:

PROBLEM TO BE SOLVED: To provide a method for depositing and etching a dielectric layer, where a dielectric constant is low and etching speed changes 3:1, for forming horizontal mutual interconnects.

SOLUTION: Quantity of carbon or hydrogen in a dielectric layer fluctuates due to the change in deposition condition for installing an etching stop layer or a low k dielectric in the application of damascene, which can be substituted for the former dielectric layer. Dual-damascene structure having a dielectric layer whose dielectric constant is not less than '2', which is lower than about 4, can execute deposition in the single reactor and is etched so that vertical or horizontal interconnects by making the concentration of carbon; oxygen gas such as carbon monoxide fluctuate. Etching gas for forming the vertical mutual interconnections comprises CO and a fluorocarbon, and CO gas is preferably removed from etching gas for forming the horizontal interconnects.



COPYRIGHT: (C)2001,JPO

(19) 日本国特許庁 (J P)

(12) 公開特許公報 (A)

(11) 特許出願公開番号

特開2001-110789

(P2001-110789A)

(43) 公開日 平成13年4月20日 (2001.4.20)

(51) Int.Cl. ⁷	識別記号	F I	テ-マ-ト (参考)
H 0 1 L 21/3065		H 0 1 L 21/31	C
21/31		21/302	J
21/768		21/90	M
			A

審査請求 未請求 請求項の数20 O L 外国語出願 (全 57 頁)

(21) 出願番号	特願2000-173807 (P2000-173807)	(71) 出願人	390040660 アプライド マテリアルズ インコーポレイテッド APPLIED MATERIALS, INCORPORATED アメリカ合衆国 カリフォルニア州 95054 サンタ クララ パウアーズ アベニュー 3050
(22) 出願日	平成12年6月9日 (2000.6.9)	(74) 代理人	100088155 弁理士 長谷川 芳樹 (外1名)
(31) 優先権主張番号	09/329012		
(32) 優先日	平成11年6月9日 (1999.6.9)		
(33) 優先権主張国	米国 (US)		

最終頁に続く

(54) 【発明の名称】 集積した低K誘電体層とエッチング停止層

(57) 【要約】

誘電率が低くかつエッチング速度が水平相互接続部を形成するのに少なくとも3:1だけ変化する誘電体層を堆積しエッチングする方法。誘電体層中の炭素又は水素の量は、ダマシン適用におけるエッチング停止層又は従来の誘電体層に置換し得る低k誘電体層を設けるために、堆積条件の変化によって変動する。誘電率が約4よりも低い2以上の誘電体層をもつデュアルダマシン構造は、単一のリアクタ内で堆積を行なうことが可能で、次に、一酸化炭素のような炭素:酸素ガスの濃度を様々に変動させることによって垂直又は水平相互接続部を形成するようにエッチングされる。垂直相互接続部を形成するためのエッチングガスは、好ましくはCO及びフルオロカーボンを含み、水平相互接続部を形成するためのエッチングガスからは、好ましくはCOガスは除外される。

